

Medical



Industrial



LED/AV

## FEATURES AND BENEFITS

Output power of 425W with airflow, only derating to 270W convection cooled

3"W x 5" L x 1.5"H Size

Universal 85-264Vac Input Range

Meets Class B Emissions levels

Greater than 10 years Electrolytic Capacitor Life

-20°C to 80°C Operating Temperature Range

Safety: Meets IEC/UL/EN60601-1, 3<sup>rd</sup> Edition +Am1 and IEC/UL/EN62368-1

Meets Heavy Industrial/IEC60601-1 4th Edition EMC Requirements

Less than 100uA Leakage Current

Class I and Class II Input versions available

3 year warranty

Covered versions available (Add "-C" to model no.)<sup>2</sup>



## MODEL SELECTION

Model Number	Nominal Output Voltage	Output Current (w/air)	Output Power (w/air) <sup>1</sup>	Output Current (convection)	Output Power (convection) <sup>1</sup>	Output Current (conduction)	Output Power (conduction)	Standby Output	Terminations	
									Input	Output
NGB425S12K	12V	30.0A	365W	19.5A	238W	19.5A	238W	5Vdc @ 1A	5 pin (pins 2, 4 removed) 0.156 Ctr Connector (Class I)	10 pin Molex Type Conn
NGB425S15K	15V	24.0A	365W	13.2A	200W	13.2A	200W			
NGB425S24K	24V	17.5A	425W	11.2A	270W	11.2A	270W			
NGB425S48K	48V	8.75A	425W	5.6A	270W	5.6A	270W			
NGB425S12C	12V	30.0A	365W	19.5A	238W	19.5A	238W	5Vdc @ 1A	5 pin (pins 2, 4 removed) 0.156 Ctr Connector (Class II)	10 pin Molex Type Conn
NGB425S15C	15V	24.0A	365W	13.2A	200W	13.2A	200W			
NGB425S24C	24V	17.5A	425W	11.2A	270W	11.2A	270W			
NGB425S35C	35V	9.45A	331W	5.7A	200W	5.7A	200W			
NGB425S48C	48V	8.75A	425W	5.6A	270W	5.6A	270W			

Notes:

- Includes 5V standby power (5W w/air, 2.5W convection).
- Unless otherwise noted, all parameters are specified at nominal input (100-264Vac), 50C ambient operating temperature. Output power is derated to 70% of rated for units with covers (-C options)
- Suffix "K" denotes Class I input and suffix "C" denotes Class II input

## INPUT

AC Input	80VAC–264VAC, single phase, 47Hz–63Hz
Input Current	3.7A max at 115VAC, 1.8A at 230VAC
Inrush Current	264VAC, cold start: will not exceed 40A peak
Input Fuses	6.3A, 250VAC fuse in both line and neutral
Earth Leakage Current	<500uA@ 264VAC, 60 Hz input, NC
Patient Leakage Current (Output to Earth)	<100uA/500uA @264VAC, 60Hz input, NC/SFC
Efficient	>90%, typical
No Load Input Power	<0.5W

## SAFETY

UL	UL62368-1 UL60601-1, 3 <sup>rd</sup> Edition, Am1 Complies with BF rated application requirements
CSA	CAN/CSA-C22.2 No. 62368-1, 60601-1, Am1, Complies with BF rated application requirements
Demko	EN62368-1 EN60601-1, 3 <sup>rd</sup> Edition, Am1 Complies with BF rated application requirements
CB Report	Design to meet 5000m and 50°C, 93% RH with 120 h (Tropical standard) according to GB4943 1-2011, IEC62368-1, IEC60601-1, Am1 Complies with BF rated application requirements



## OUTPUT

Output Power	See model list above
Ripple and Noise	1% of Vout on all other models
Load Regulation	2%
Line Regulation	1%
Total Regulation	5%
Minimum Load	Not required
Initial Set Point Tolerance	±1 %
Output Adjustability	5%
Overshoot	<5% overshoot at turn-on, <1% overshoot at turn-off, under all conditions
Monotonic Wave form	PSU shall have monotonic wave forms on the main output at start up, shut down and fault (OVP, OCP, OTP, OPP, SCP) triggered shutdown
Transient Response	500μs response time for return to within 0.5% of final value for any 50% load step over the range of 25% to 100% of rated load, $\Delta i/\Delta t < 0.2A/\mu s$ . Max. voltage deviation is ±3.5% of final value
Capacitive Load	1000μF

### Notes:

Unless otherwise noted, all parameters are specified at nominal input (115VAC/230VAC), 25°C ambient operating temperature, full rated output power, and nominal output voltage.

## RELIABILITY

MTBF	>>500K hours, 25°C, full rated load at 110VAC input.
Warranty	3 Years
REACH	REACH compliance required
ROHS	Product is ROHS compliant
Electrolytic Capacitor Lifetime	All specified Electrolytic Capacitors shall exceed 10 year life based on operating at 25°C ambient temp., 24 hrs/day, 365 days/year, 6 power up cycles/day.

## PROTECTION

Overvoltage Protection	115% to 155% of nominal output voltage. Latch off, recycle AC input to reset.
Short Circuit Protection	Short across the output terminals will not cause damage to the unit. Latch-off Mode
Thermal Protection	Will shutdown upon an overtemperature condition, auto-recovery
Overload Protection	130%–180% of rated output current value, Hiccup Mode

## ISOLATION

Insulation Safety Rating	Input-Ground: 2000VAC, 1 MOPP Input-Output: 4750VAC, 2 MOPP Output-Ground: 2000VAC, 1 MOPP
Electric Strength Test Voltage (HIPOT)	Input-Ground: 2000VAC Input-Output: 4750VAC Output-Ground: 2000VAC

Notes: Input/Output-Ground: Class I only

## ENVIRONMENT

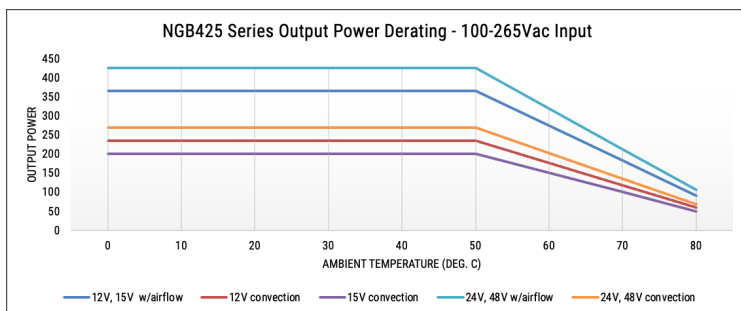
Operating Temperature Range	-20°C to +80°C
Power Derating over temperature	Derate output power above 50°C - see derating table for details
Relative Humidity	5% to 95%, non-condensing
Altitude	Operating: -500m to 5,000m Non-operating: -500m to 12,192meters
Storage Temperature	-40°C to +85°C
Vibration	Random Vibration: Operating: 0.003g/Hz, 1.5 grams overall, 3 axes, 10 min/axis, 5Hz-500Hz. Non-Oper.: random waveform, 3 minutes/axis, 3 axes and Sine waveform, Vib. frequency/acceleration: 10Hz-500Hz/1g, sweep rate of 1 octave/minutes, Vibration time of 10 sweeps/axes, 3 axes Transportation Vibration: Random vibration per MIL-STD-810E, Method 514.4, Cat. 1, Figure 514.4-1, 1hr in each of three axes
Shock (IEC 60068-2-27)	Operating: Half-sine, 20gpk, 10ms, 3 axes, 6 shocks total. Non-Operating: Half-sine waveform, impact acceleration of 50G, Pulse duration of 6ms, Number of shocks: 3 for each of the three axis
Cooling	400LFM of airflow, Natural Convection, or conduction. See chart for applicable output ratings.
Audible Noise	<20dba



## UNIT PACKAGING REQUIREMENTS

Inserted Instructions	Instruction Sheet to be provided with all units packaged in individual unit box if used
Individual Unit Packing	Units can be packed in egg crate type cartons for production quantities. Individual product shipments should include an individual unit box
Master Carton Shipping Box	40 units per master carton. Unit packaged into carton must be protected such that it will sustain 1.4m drop test onto hard surface. Only anti-static packing material may be used inside the box. Exterior box sealing tape shall be anti-static type.
Individual Carton Packing Box (when used)	Individual carton must be labeled with ROHS sticker and individual label showing unit serial number, bar code, manufacturing date, bar code, and Manufacturing part number, bar code, country of origin.

## DERATING CURVES



## MECHANICAL SPECIFICATIONS

Dimensions	W: 3" x L: 5" x H: 1.5"
Input Connector	See table below
Output Connector	See table below
Unit Weight	490g

## EMI/EMC COMPLIANCE<sup>1</sup>

Conducted Emissions	EN55011/15/32: Class B, CISPR11/15/32: Class B, FCC Part 15.107, Class B, Measured at 10%, 50%, and 100% load steps; 6db margin typ, at 120VAC and 230VAC
Radiated Emissions <sup>2</sup>	EN55011/15/32: Class B, CISPR11/15/32: Class B, FCC Part 15.107, Class B, Measured at 10%, 50%, and 100% load steps; 3db margin typ, at 120VAC and 230VAC
Harmonic Current Emissions	EN61000-3-2, Class A at 230VAC, 100% load
Voltage Fluctuations & Flicker	IEC61000-3-3
Electro Static Discharge Immunity	EN55024/IEC61000-4-2, Level 4: ±8kV contact, ±15kV air, Criteria A IEC60601-1-2, 4 <sup>th</sup> Edition, Table 4
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3, 10V/m, 80MHz-2.7GHz, 80% AM at 1kHz IEC60601-1-2, 4 <sup>th</sup> Edition, Table 4
Electrical Fast Transients / Bursts	EN55024/IEC61000-4-4, Level 4, ±4kV, 100Khz rep rate, 40A, Criteria A IEC60601-1-2, 4 <sup>th</sup> Edition, Table 5
Surges Line to Line (DM) and Line to Ground (CM)	EN55024/IEC61000-4-5, Level 4, ±2kV DM, ±4kV CM, Criteria A Surpasses IEC60601-1-2, 4 <sup>th</sup> Edition requirements
Conducted Disturbances induced by RF Fields	EN55022/IEC61000-4-6, 3V/m – Level 4, 0.15 to 80MHz; and 12V/m) in ISM and amateur radio bands between 0.15MHz and 80MHz, 80% AM at 1KHz IEC60601-1-2, 4 <sup>th</sup> Edition, Table 5
Rated Power Frequency Magnetic Fields Test	EN55024/IEC1000-4-8, Level 4: 30A/m, 50Hz/60Hz IEC60601-1-2, 4 <sup>th</sup> Edition, Table 4
Voltage Dips <sup>3</sup>	EN55024/IEC/EN61000-4-11: --100% dip for 10 mS, at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°: --100% dip for 20mS, 0°, Criteria B --100% dip for 5000mS (250/300 cycles), Criteria B -- 60% dip for 100mS, Criteria B -- 30% dip for 500mS, Criteria B IEC60601-1-2, 4 <sup>th</sup> Edition, Table 5
Common Mode Noise: High Freq. (100KHz-20MHz)	500mA pk-pk

### Notes:

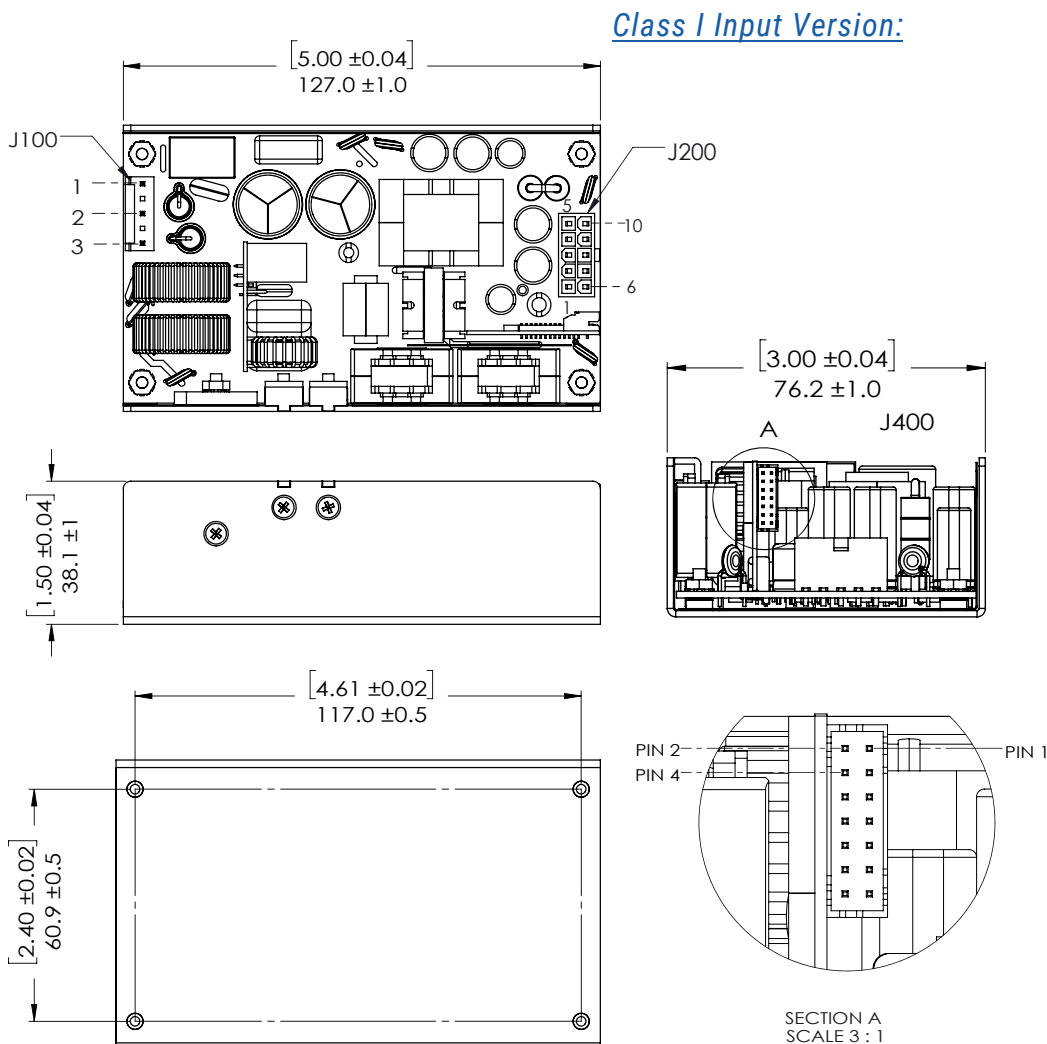
- Performance criteria are based on EN55024. According to the standards, performance criteria are defined as following:  
A – Normal performance during and after the test  
B – Temporary degradation, self-recoverable  
C – Temporary degradation, operator intervention required to recover the operation  
D – Permanent damage
- Class II models meet Class A radiated emissions. Class B can be met with added ferrite on input cable. Consult SL Power for details.
- 100% dip for 20mS Criteria A @ 80% load; 30% dip for 500mS Criteria A @ 80% load.



## SYSTEM TIMING SPECIFICATIONS

Label	Parameter	Min	Typ	Max	Unit
T1	Turn-On Time – Main outputs	500		1000	mSec
T2	Turn-On Time – 5Vsb output			100	mSec
T3	Rise Time, 10% Vmain to Vmain in regulation			100	mSec
T4	Hold up time - All outputs stay within regulation after loss of AC @ 80% Load	20			mSec
T5	Hold up time - Vsb - stays within regulation after loss of AC	100			mSec
T6	Turn-On Time at -20°C		300		mSec

## OUTLINE DRAWING



### CONNECTOR INFORMATION

**J100:** AC INPUT - 5 pin Header (2 pins removed)  
PIN 1: GND  
PIN 2: LINE  
PIN 3: NEUTRAL

**J200:** DC OUTPUT - 10 pin Header  
PIN 1: RTN  
PIN 2: RTN  
PIN 3: RTN  
PIN 4: +Vout  
PIN 5: +Vout  
PIN 6: RTN  
PIN 7: RTN  
PIN 8: +Vout  
PIN 9: +Vout  
PIN 10: +Vout

**J400:** SIGNALS - 14 pin Header  
PIN 1: RTN  
PIN 2: NC  
PIN 3: S+  
PIN 4: RTN  
PIN 5: NC  
PIN 6: DC OK  
PIN 7: NC  
PIN 8: INHIBIT  
PIN 9: NC  
PIN 10: NC  
PIN 11: RTN  
PIN 12: NC  
PIN 13: +5V standby  
PIN 14: +5V standby

### MATING PARTS:

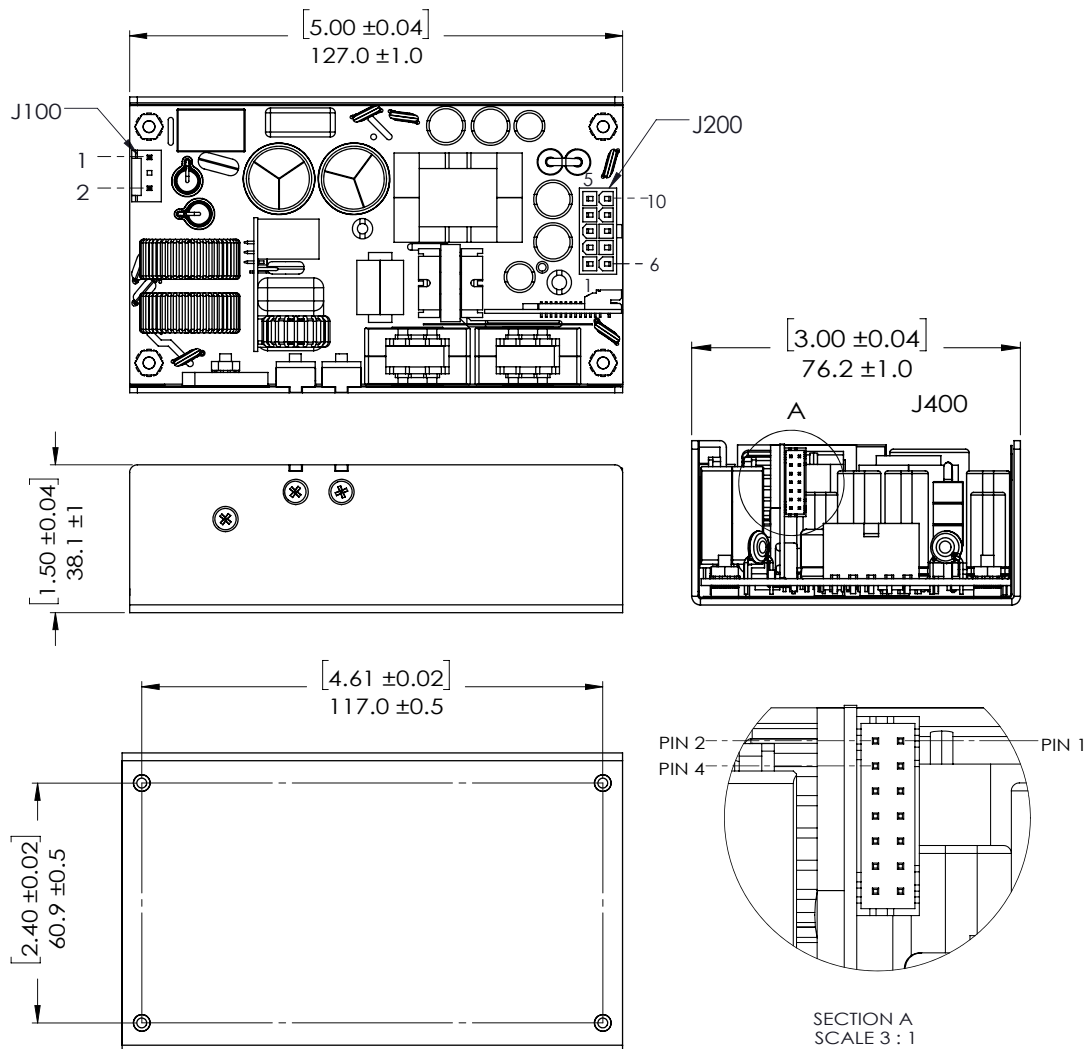
**J100:** AMP 640250-5, Pins: 640252-1  
**J200:** CviLux: CP-01110020, Pins: CP-01100106-HC  
Or Molex 39-01-2105  
**J400:** Landwin: 2050S1400, Pins: 2053T021N  
or JST PHDR-14VS

S+: remote sense function of output voltage.  
INHIBIT: Logical "High" or "Open" enables and Logical "Low" disables main output.



## OUTLINE DRAWING

### Class II Input Version:



### CONNECTOR INFORMATION

<b>J100:</b>	AC INPUT - 3 pin Header (middle pin removed)
PIN 1:	LINE
PIN 2:	NEUTRAL
<b>J200:</b>	DC OUTPUT - 10 pin Header
PIN 1:	RTN
PIN 2:	RTN
PIN 3:	RTN
PIN 4:	+Vout
PIN 5:	+Vout
PIN 6:	RTN
PIN 7:	RTN
PIN 8:	+Vout
PIN 9:	+Vout
PIN 10:	+Vout
<b>J400:</b>	SIGNALS - 14 pin Header
PIN 1:	RTN
PIN 2:	NC
PIN 3:	S+
PIN 4:	RTN
PIN 5:	NC
PIN 6:	DC OK
PIN 7:	NC
PIN 8:	INHIBIT
PIN 9:	NC
PIN 10:	NC
PIN 11:	RTN
PIN 12:	NC
PIN 13:	+5V standby
PIN 14:	+5V standby

### MATING PARTS:

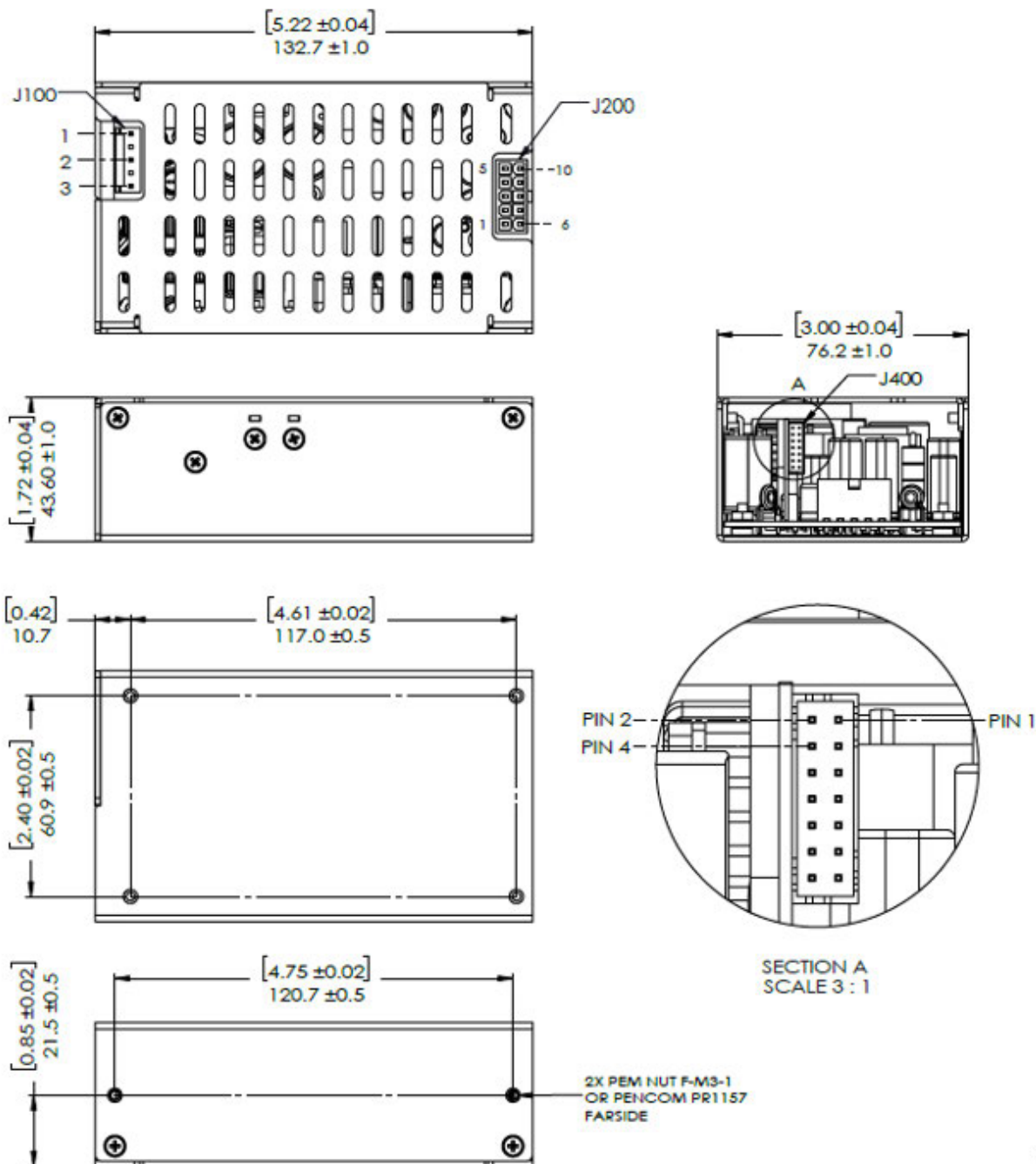
<b>J100:</b>	AMP 640250-3, Pins: 640252-1
<b>J200:</b>	CviLux: CP-01110020, Pins: CP-01100106-HC Or Molex 39-01-2105
<b>J400:</b>	Landwin: 2050S1400, Pins: 2053T021N or JST PHDR-14VS





## OUTLINE DRAWING

Covered Version:



Note: For pinout information, see the applicable model version information on the previous pages.